FIG. 5 is a cross-sectional view of an actual nozzle 13" in engagement with a sprue bushing 16" on a fixed platen 15. (Figure should show a mold at least in outline)

It is to be understood that the invention is not limited to the illustrations described and shown herein, which are deemed to be merely illustrative of the best modes of carrying out the invention, and which are susceptible of modification of form, size, arrangement of parts and details of operation. The invention rather is intended to encompass all such modifications, which are within its spirit and scope as defined by the claims.

What is claimed is:

1. In a metallic material injection molding machine, an injection nozzle joined to an injection barrel of said injection molding machine, a stationary platen holding a portion of a mold, a sprue bushing mounted in said mold, said nozzle engaging said sprue bushing when said metallic material is injected through said sprue bushing into said mold, said nozzle having a spigot portion which extends into a channel in said sprue bushing, an outer periphery of said spigot fitting within a surface of said channel so as to create a gap between between said surface and said periphery of said spigot that permits a limited amount of metallic material to enter the gap and solidify in the gap to form a seal and thereby prevent loss of metallic material through the interface between said nozzle and said sprue bushing during an injection cycle, said limited amount of material being attached to a sprue and removed therewith.

2. In a metallic injection molding machine as in claim 1 wherein said metallic material is a metal alloy.

3. In a metallic material injection molding machine as in claim 2 wherein said alloy is selected from alloys of magnesium, zinc or aluminum.

4. In an injection machine as defined in claim 1, claim 2 or claim 3 wherein said spigot portion and said channel are dimensioned such that, during an injection cycle, said spigot portion and channel are free to move axially relative to one another a distance which is less than the length of said spigot portion.

5. In an injection molding machine as defined in any one of claims 1, 2, 3 or 4 wherein said spigot portion is of a length sufficient to maintain sealing between said channel and said spigot portion during an injection cycle and short enough to permit release of any metallic material retained between said channel and said spigot portion when a sprue is released from said channel.

6. An improved nozzle and sprue bushing connection for a metallic material injection molding machine, said sprue bushing having a first cylindrical surface and said nozzle having a second cylindrical surface of smaller diameter than said first surface, said second surface fitting within first cylindrical surface to provide a gap between said first surface and said second surface when said nozzle is engaged in said bushing that permits a limited amount of metallic material to enter the gap and solidify in the gap to form a seal, said limited amount of material being attached to a sprue and removed therewith, said first and second surfaces being of sufficient length to permit limited axial movement therebetween without a loss of sealing between said surfaces.

7. An improved connection as defined in claim 6 wherein said nozzle has a third cylindrical surface of similar diameter to said first cylindrical surface and wherein said first and third cylindrical surfaces are in close non-contacting relationship when said nozzle is engaged in said sprue bushing.

8. An improved nozzle and sprue bushing connection for a metal injection molding machine wherein said nozzle has a first portion which fits inside a surface portion of said sprue bushing, wherein said first portion and said surface portion are separated by a small gap that permits a limited amount of metallic material to flow into said gap and solidify in said gap to form a seal, wherein said nozzle can move axially within said sprue bushing without losing sealing contact between said nozzle and said bushing.

9. An improved connection as defined in claim 8 wherein said portions are cylindrical.

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